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The deaths of Thomas Clyde, a member, and of Friedrich Ritter v. Stein, a correspondent, were announced.

The following minute was adopted :

The Academy of Natural Sciences of Philadelphia learns with profound regret of the death of Prof. Wm. Wagner, one of its earliest members, whose generous encouragement of scientific pursuits has done much to foster a study of the natural sciences in this country.

Observations on Tenacity of Life, and Regeneration of Excised Parts in Lumbricus terrestris.—MISS ADELE M. FIELDE remarked that the observations recorded before the meeting held Jan. 6, were made in the laboratory of the Academy of Natural Sciences of Philadelphia. The temperature had been nearly constant at about 60°, and varied only from 55° to 65°. The observations began Nov. 29, 1884. No worm lived more than a few hours when exposed to the air. Worms kept in water, without food, the water changed daily, lived from eleven to fourteen days. It made no apparent difference in the duration of life, whether the worms were kept in darkness or in light.

Eight portions of worms, consisting of from twenty to thirty segments, taken from the posterior end, had lived in earth during the forty days of observation, and though plump, healthful, and with blood of its usual redness, showed no signs of growth at either end. Between the segments, however, new half-segments had been inserted, after a method which ladies in sewing call a gusset. Some of these worms had five such insertions, while no similar half-segments were observed in many worms that were examined, in order to ascertain whether such half-segments existed in whole and healthy worms. These new half-segments appeared at irregular distances apart, between the old segments, on the sides of the portions of worms, and appeared to be a manner of growth not heretofore observed in earthworms regenerating excised parts.

Nine worms from which the five anterior segments were excised Nov. 29, had been kept in moist earth, with which comminuted leaves of oak and maple were mingled. The brain of the earthworm lies in the third segment, and the first subœsophageal ganglion in the fourth segment, so that the brain and œsophageal collar were removed by the excision. All these worms were living, and a part of them had wholly regenerated the excised segments.

Ten worms, which at the same date lost five anterior and from twenty to thirty posterior segments, were all alive and were regenerating the excised portions.

Eight worms, which at the same date lost their posterior seg-

ments to within ten behind the clitellum, were all living and had regenerated some portion of the excised part.

The manner of regeneration of the excised anterior five segments had been :—

1. A union of the outer coat of the body with the lining of the alimentary canal, roughly healing the wound.

2. A prolongation of these coats, forming a translucent white tube which could be protruded from and retracted into the projecting border of the wound. This tube was at first but a third or a half the diameter of the body.

3. The formation of the lip or proboscis on the superior side of the end of the tube.

4. Segmentation proceeding from the anterior end of the regenerated part backward, until the normal number of segments were reproduced.

5. The deposit of coloring matter in the epidermis of the new segments, and their enlargement to the diameter of the old segments.

Reference was made to the observations published by Dr. Bülow in the "*Archiv für Naturgeschichte*," 1882.

Miss Fielde now further reports having found a completely regenerated brain, œsophageal collar, and subœsophageal ganglion, all of normal size and in normal site, in earthworms, which had fifty-eight days previous been decapitated at the fifth segment. The worms had been kept in earth, at a temperature of about 60°.

The precautions taken to ensure accuracy in these observations had been, first, a thorough examination of all the earth into which the decapitated worms were put, making it certain that the earth contained no other worms than the decapitated ones; secondly, care that nothing containing earthworms was at any time added to the earth in which the decapitated worms were kept; thirdly, repeated examinations, at intervals of less than a week, of all the earth holding the decapitated worms, and the careful removal of minute worms bred therein; fourthly, frequent counting of the decapitated worms, with examination under a lens, the evident wound constantly showing that the worms under observation were the individuals decapitated. The paler color of the new portions also distinguished these worms from others.

Forty days after decapitation, the excised segments had been regenerated, so as to present an external appearance of completeness, but no brain was visible in dissection. Forty-five days after decapitation the blood-vessels were seen ramifying on the completely regenerated pharynx in a normal manner, but no brain was found. In one of the worms dissected on the fifty-eighth day after decapitation, the subœsophageal ganglion and the œsophageal collar were found to be complete and of the normal size, but the brain lobes were of but half the normal size, and were separated by an interspace of the width of one of the lobes. The blood-vessels united normally on the median line between

the lobes. Another worm decapitated at the same date, though of apparently weaker vitality, had regenerated all the excised portions, and showed a completely formed brain, with lobes of the normal size in contact.

Messrs. Burnett Landreth and J. Addison Campbell, and Mrs. Cornelius Stevenson, were elected members.

FEBRUARY 3.

Mr. GEORGE W. TRYON, Jr., in the chair.

Twenty-seven persons present.

FEBRUARY 10.

Rev. H. C. McCook, D. D., Vice-President, in the chair.

Twenty-two persons present.

The Internal Cambium Ring in Gelsemium sempervirens.—Dr. J. T. ROTHROCK, at the meeting of the Botanical Section held February 9, called attention to the internal cambium ring in the stem of *Gelsemium sempervirens*. It might well be designated as the inner cambium. His attention was attracted by the fact that in a *stem* of three-eighths of an inch diameter, the pith was actually less in diameter than in a *twig* of a quarter the size of the *stem*. Microscopic examination showed that in the larger stem there were ordinarily four or more points, at which a well-defined swelling curved inward from the circumference of what should have been the pith-cavity. These swellings resolved themselves when closely examined into :—

1. Toward the centre an imperfectly defined membrane, resembling cuticle, which was not always present.
2. One or more rows of large cells like the parenchyma we find under the epidermal layer.
3. Several poorly defined layers of smaller cells, such as often mark the limits of growth in bark.
4. The frequent presence of bast fibres or of sclerenchyma cells.
5. An evident layer of thin-walled, square cells, closely resembling, though somewhat smaller than those of the external cambium. They showed signs of division, which indicated that they were still a living tissue.

These facts explained at once why the pith was constantly being encroached upon until it at length almost disappeared. The medullary rays dipped down through, and widened out, in